Organic Pesticide is NOT an Oxymoron

- **Gary Fish**
  Maine Board of Pesticides Control
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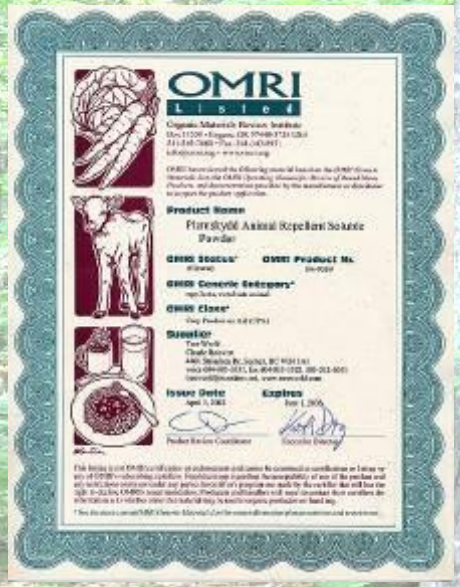
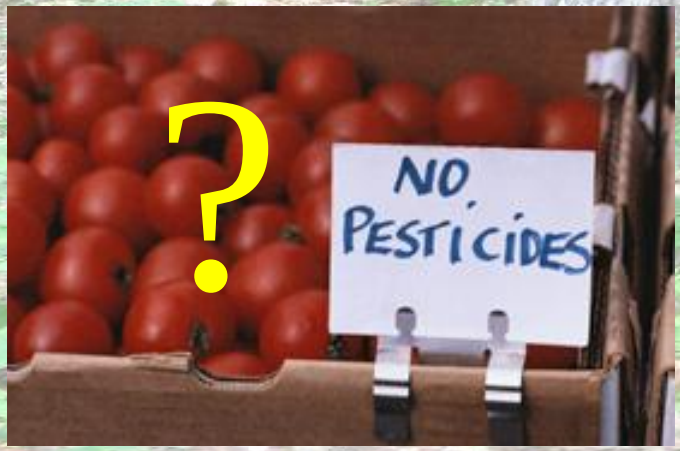
Do organic growers use pesticides?

- Over 25% of OMRI listed products are pest management products*
- 312 are registered by EPA as pesticides*
- 188 are registered as pesticides in Maine*
- 139 of the pesticide products are not registered by EPA and should not be used to control pests in the US*





*2009 Data gathered by Lebelle Hicks and Gary Fish Maine BPC

Organic produce may contain organic pesticide residues

- According to the 2008 USDA Pesticide Data Program Report:
  - 43% of organic spinach samples were positive for spinosad
    (13 of 30 samples positive)
- According to the 2010 USDA Pesticide Data Program Report:
  - 52% of organic baby food pear samples were positive for spinosad
    (16 of 31 samples)
- Spinosad is derived from a naturally occurring soil bacteria

Dow AgroSciences

Entrust®

A Naturalyte® insect control product formulated for the organic grower for control of lepidopterous larvae (worms or caterpillars), leafminers, thrips, and red imported fire ants.

This bag [container] is not for individual resale.

Active Ingredient:
spinosad
(a mixture of spinosyn A and spinosyn D) 80%
Other Ingredients 20%
Total 100%

Contains 80% active ingredient on a weight basis.
U.S. Patent No. 5,362,634 and 5,496,931

OMRI Listed
Listed by the Organic Materials Review Institute (OMRI) for use in organic production.

Keep Out of Reach of Children

Agricultural Use Requirements
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR Part 170. Refer to the label booklet under "Agricultural Use Requirements" in the Directions for Use section for information about this standard.

Refer to inside of label booklet for additional precautionary information including Directions for Use.

Notice: Read the entire label. Use only according to label directions. **Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies at end of label booklet. If terms are unacceptable, return at once unopened.**

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at www.dowagro.com.

EPA Reg. No. 62719-282 900-014240 / 00216558

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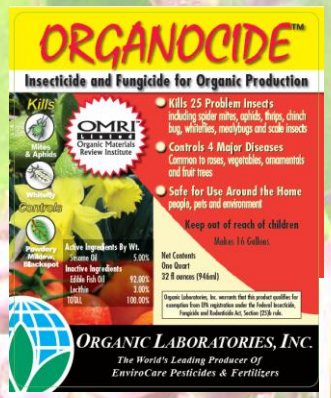
No endorsement intended or implied

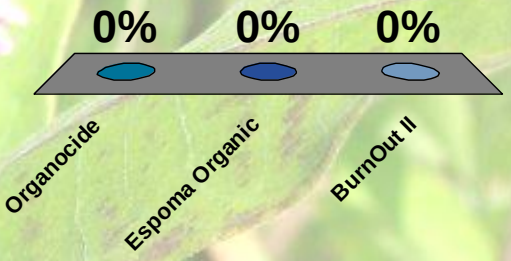
Which are pesticides?

1. Organocide



2. Espoma Organic

3. BurnOut II



No endorsement intended or implied

What is a pesticide?

- **Any substance or mixture of substances intended for:**
  - **preventing,**
  - **destroying,**
  - **repelling, or**
  - **mitigating any pest**

No endorsement intended or implied

- **Or, any plant regulator, defoliant or desiccant.**
- **Does not include fertilizers or nutrients**

These are pesticides?

- Disinfectants & bleaches
- Herbicides
- Rat & mouse baits
- Fungicides

No endorsement intended or implied

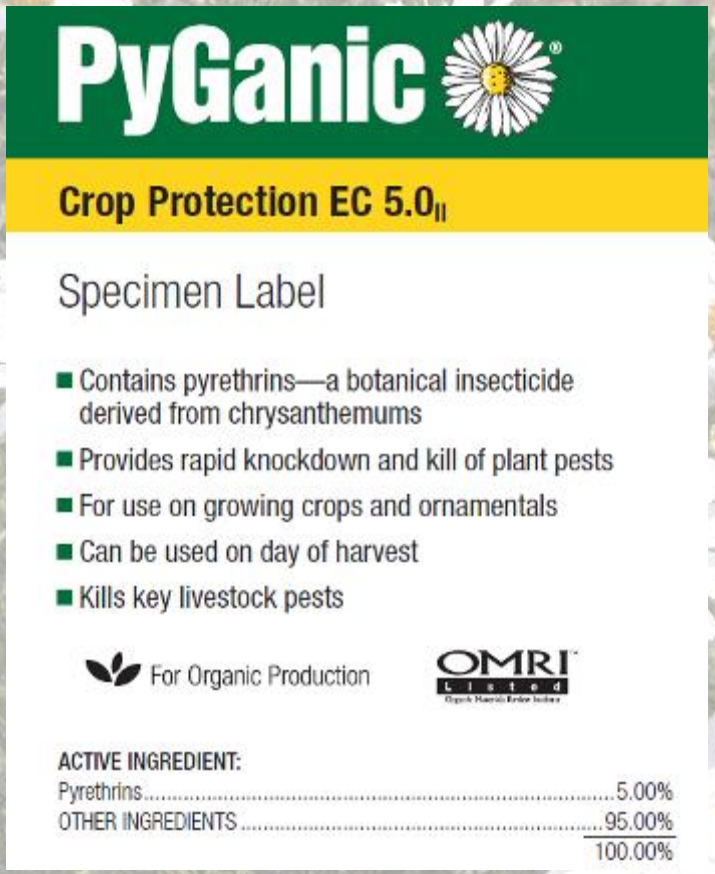
These are pesticides?

- Insecticides
- Botanicals
- Biological controls
- Deer and rabbit repellents

No endorsement intended or implied

Are botanical pesticides risky?

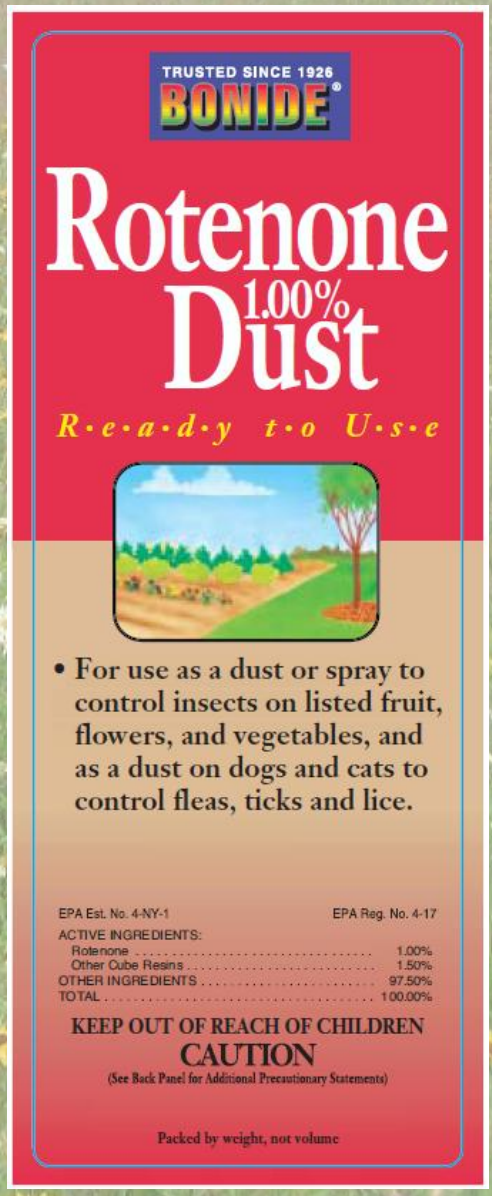
- Pyrethrin has a changing cancer rating –
  - EPA now ranks it as a “not likely to be a human carcinogen” unless exposure is at doses that cause increased cell division in the liver
- It has also been shown to be a thyroid hormone disruptor
- Residues are detected in organic and conventional foods at low levels



No endorsement intended or implied

Are botanical pesticides risky?

- Old standby botanical insecticide
- In 2006 the manufacturers/distributors voluntarily canceled the registration
- Why? In 2004 EPA required an inhalation neuro-toxicity study.
  - Induces Parkinson's Disease-like symptoms
  - Induces liver cells to self-destruct
  - Dust products are of particular concern for inhalation exposure.
  - Because of fetal sensitivity EPA required a 10X reduction in exposure potential



No endorsement intended or implied

Are “organic” fungicides risky?

- Copper is an element, so it does not degrade in the soil
- Since 2006 the EU has severely restricted use of copper fungicides (5.4 lbs/Ac/Yr) and Holland and Denmark have banned them
- On average organic crops contain 10% more copper than conventional crops

No endorsement intended or implied

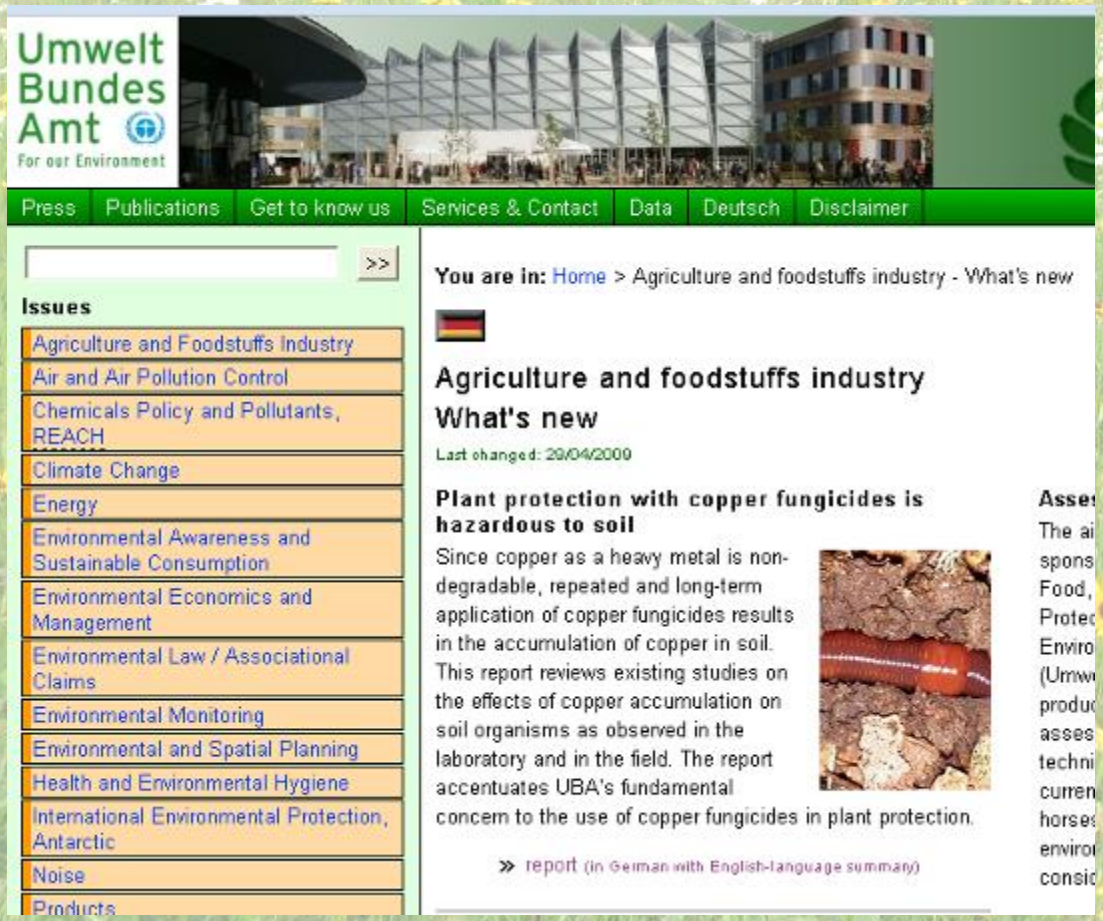
Battling blight the organic way

An example of the blight-free potatoes

Potato late blight is a serious disease in both conventional and organic agriculture, causing drastic crop loss as the Irish potato famine of 1845 most graphically demonstrated. Organic production of potatoes has long relied on copper based fungicides to control blight, but the negative impact of the accumulation of copper in perennial crops (e.g. grapevine and top fruit) led, in March 2002, to a ban on their use in organic agriculture across Europe. Organic potato producers must learn to control blight without copper while maintaining the yields required to remain competitive. A Europe-wide project, funded via the European Commission's Key Action Five programme, is underway that seeks to develop new strategies for the long-term control of potato blight in organic agriculture.

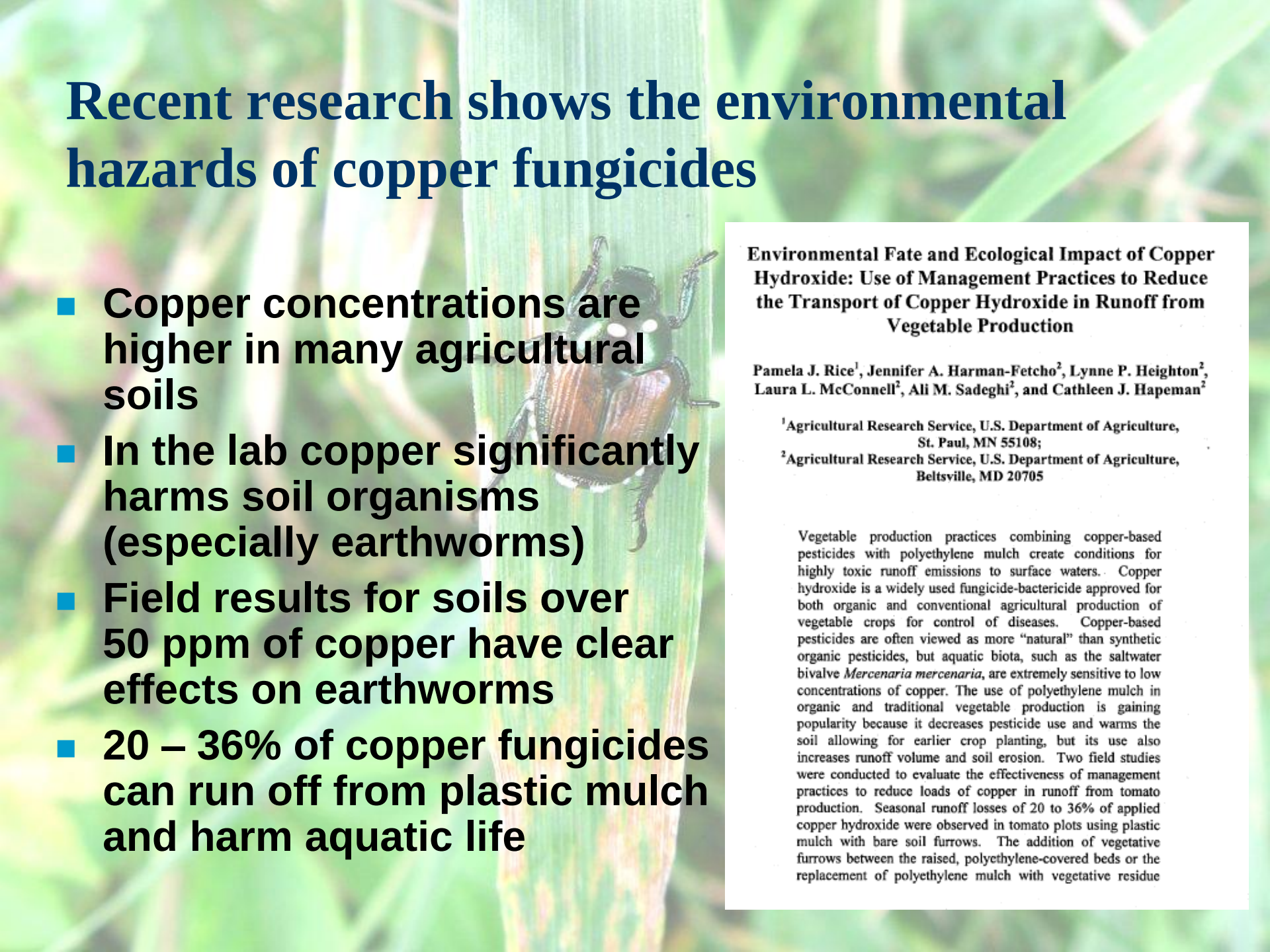
Are “organic” fungicides risky?

- **Soil accumulation is especially pronounced in perennial crops**



Recent research shows the environmental hazards of copper fungicides

- Copper concentrations are higher in many agricultural soils
- In the lab copper significantly harms soil organisms (especially earthworms)
- Field results for soils over 50 ppm of copper have clear effects on earthworms
- 20 – 36% of copper fungicides can run off from plastic mulch and harm aquatic life



Environmental Fate and Ecological Impact of Copper Hydroxide: Use of Management Practices to Reduce the Transport of Copper Hydroxide in Runoff from Vegetable Production

Pamela J. Rice[1], Jennifer A. Harman-Fetcho[2], Lynne P. Heighton[2], Laura L. McConnell[2], Ali M. Sadeghi[2], and Cathleen J. Hapeman[2]

[1]Agricultural Research Service, U.S. Department of Agriculture, St. Paul, MN 55108;
[2]Agricultural Research Service, U.S. Department of Agriculture, Beltsville, MD 20705

Vegetable production practices combining copper-based pesticides with polyethylene mulch create conditions for highly toxic runoff emissions to surface waters. Copper hydroxide is a widely used fungicide-bactericide approved for both organic and conventional agricultural production of vegetable crops for control of diseases. Copper-based pesticides are often viewed as more "natural" than synthetic organic pesticides, but aquatic biota, such as the saltwater bivalve *Mercenaria mercenaria*, are extremely sensitive to low concentrations of copper. The use of polyethylene mulch in organic and traditional vegetable production is gaining popularity because it decreases pesticide use and warms the soil allowing for earlier crop planting, but its use also increases runoff volume and soil erosion. Two field studies were conducted to evaluate the effectiveness of management practices to reduce loads of copper in runoff from tomato production. Seasonal runoff losses of 20 to 36% of applied copper hydroxide were observed in tomato plots using plastic mulch with bare soil furrows. The addition of vegetative furrows between the raised, polyethylene-covered beds or the replacement of polyethylene mulch with vegetative residue

Essential oil pesticides

- **Some pesticides have been deregulated by EPA**
  - **FIFRA 25(b) Exempt**
  - **Exempt from Federal registration**
  - **Exempt from toxicity testing**
  - **Some are OMRI listed**

No endorsement intended or implied

Ingredients in these products

- **Rosemary oil**
- **Peppermint oil**
- **Thyme oil**
- **Clove oil**
- **Wintergreen oil**
- **Cinnamon oil**

What do we know about essential oil pesticide risks?

- Not enough since they are exempt from toxicity tests
- Rosemary oil – not well tested
- Peppermint oil –
  - sensitization,
  - irritant,
  - lung damage,
  - not recommended for children, infants or during pregnancy or breast feeding
- Clove oil –
  - allergic reactions,
  - not good for people with liver or kidney disorders,
  - increases bleeding risks,
  - interacts with drugs,
  - contains eugenol which when methylated becomes a potent carcinogen

No endorsement intended or implied

What are the risks?

- **Wintergreen oil –**
  - **highly toxic,**
  - **not recommended during pregnancy,**
  - **causes dermatitis,**
  - **inhalation hazard**
- **Cinnamon oil –**
  - **powerful irritant and**
  - **even worse sensitizer**

EcoSMART ORGANIC INSECTICIDE — FLYING INSECT KILLER

Introducing EcoSMART FLYING INSECT KILLER

Now there is a new, organic, fast-killing insecticide that is **safe to use around children and pets.** Unlike other insecticides, it is made from organic plant oils and kills bugs naturally to better protect your family. Plus, there's no pesticide residue. It's safe. It's effective. It's smart. Naturally.

To learn more about the EcoSMART story, as well as our products and technology, please visit us at **www.ecosmart.com.**

FRESH NATURAL SCENT SIGNALS IT'S WORKING.

DIRECTIONS FOR USE:

SHAKE WELL BEFORE USING. READ ENTIRE LABEL AND USE ACCORDINGLY.

FLYING INSECT TREATMENT: Kills flies, gnats, mosquitoes, moths, wasps and other flying insect pests on contact. Hold container upright and aim nozzle away from person. Press button firmly to spray. Direct spray at flying insects, contacting as many insects as possible. Spray in short 2-3 second bursts.

NOTE: When used indoors, wipe away excess product.

PRECAUTIONARY STATEMENTS: We recommend good safety practices when using any insecticide, such as avoiding contact with eyes and skin. If product gets in eyes, flush with water for at least 15 minutes. If on skin, wash with soap and water. If irritation persists, contact a physician.

PHYSICAL HAZARDS: Contents under pressure. Keep away from heat, sparks and open flames. Do not puncture or incinerate container. Exposure to temperatures above 130° Fahrenheit may cause container to burst.

STORAGE & DISPOSAL: CAUTION: Keep out of reach of children. Store in a cool, dry area away from heat or open flame. When container is empty, recycle if available. Do not puncture or incinerate.

LIMITATION OF LIABILITY: EcoSMART makes no warranties of merchantability or of fitness for a particular purpose, nor any other express or implied warranty except as stated above. Buyer assumes all responsibility for safety and use not in accordance with label directions and precautionary statements.

EcoSMART represents that this product is a Minimum-Risk pest control product, and qualifies for exemption from EPA registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

Active Ingredients: Organic Plant Oils

Peppermint Oil	2.00%
Cinnamon Oil	1.00%
Sesame Oil	1.00%
Other Ingredients*	96.00%
Total	100.00%

*Water, Wintergreen Oil, Isopropanol, Canola Oil, Lecithin, Carbon Dioxide

EcoSMART

Questions or Comments? Call **1-877-723-3545**
24 hours a day, 7 days a week

EcoSMART Technologies

Manufactured for
EcoSMART TECHNOLOGIES, INC.
3600 Mansell Road, Suite 150
Alpharetta, GA 30022

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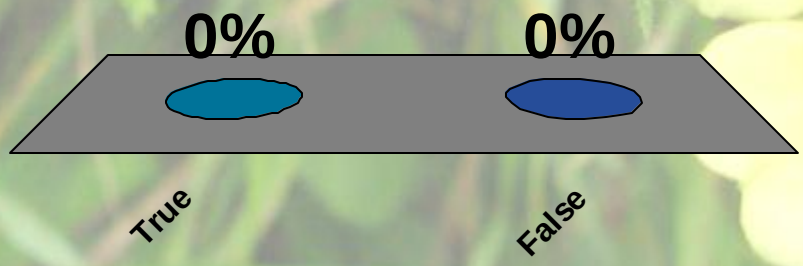
No endorsement intended or implied

Organic products are not harmful to bees, pollinators and other beneficial organisms

1. True
2. **False**



Toxicity of Common Organic-Approved Pesticides to Pollinators

PESTICIDE	NON-TOXIC	LOW TOXICITY	HIGHLY TOXIC
Insecticides/Repellants/Pest Barriers			
Bacillus thuringiensis (Bt)	■		
Beauveria bassiana			■
Cydia pomonella granulosis	■		
Diatomaceous Earth			■
Garlic	■		
Insecticidal Soap			■
Kaolin Clay	■		
Neem		■	
Horticultural Oil			■
Pyrethrins			■
Rotenone			■
Sabadilla			■
Spinosad			■
Herbicides/Plant Growth Regulators/Adjuvants			
Adjuvants		■	
Corn Gluten	■		
Gibberellic Acid	■		
Horticultural Vinegar		■	
Fungicides			
Copper		■	
Copper Sulfate			■
Lime Sulfur	■		
Sulfur			■

Eric Mader – The Xerces Society for Invertebrate Conservation

All pesticides have risks!!!

- Organic ≠ Safe
- Synthetic ≠ Highly toxic
- Natural ≠ Safe

No endorsement intended or implied

Even organic products are toxic!

SCIENTIFIC AMERICAN™

Are lower pesticide residues a good reason to buy organic? Probably not.

By Christie Wilcox | September 24, 2012 | 37

Share Email Print

A lot of organic supporters are up in arms about the recent Stanford study that found no nutritional benefit to organic foods. Stanford missed the point, they say—it's not about what organic foods have in them, it's what they don't. After all, avoidance of pesticide residues is the #1 reason why people buy organic foods.

Yes, conventional foods have more synthetic pesticide residues than organic ones, on average. And yes, pesticides are dangerous chemicals. But does the science support paying significantly more for organic foods just to avoid synthetic pesticides? No.

A Pesticide Is A Pesticide

I'm not saying that pesticides, herbicides, and insect repellants aren't toxic. I certainly wouldn't recommend drinking cocktails laced with insect-repelling chemicals, for without a doubt, they can be bad for you. Pesticide exposure has been linked to all kinds of diseases and conditions, from neurodegenerative diseases like Parkinson's to cancer. What we do know, though, is that natural isn't synonymous with harmless. As a 2003 review of food safety concluded, "what should be made clear to consumers is that 'organic' does not equal 'safe'."

I've said it before and I'll say it again: there is nothing safe about the chemicals used in organic agriculture. Period. This shouldn't be that shocking – after all, a pesticide is a pesticide. "Virtually all chemicals can be shown to be dangerous at high doses," explain scientists, "and this includes the thousands of natural chemicals that are

http://blogs.scientificamerican.com/science-sushi/2012/09/24/pesticides-food-fears/

Even organic products are toxic!

TABLE 2-12 Original chart from Pests of the Garden and Small Farm by Mary Louise Flint Amended by Gary Fish September 2007

Oral LD_{50} Values for Some Pesticides Used in Small Farms and Gardens.

CHEMICAL	COMMON TRADE NAMES	ORAL LD_{50}[a]	EIC[b]	TYPE OF PESTICIDE
Nicotine	Black Leaf 40	55	45[1]	insecticide
Rotenone*		132	33	insecticide
Bordeaux*		300	68	fungicide
Diazinon		300	43	insecticide
2,4-D		375	17	herbicide
Carbaryl	Sevin	500	21	insecticide
Acephate	Orthene	866	23	insecticide
Copper hydroxide*	Kocide	1000	33	fungicide
Copper oxychloride sulfate*	C-O-C-S	1000	33[1]	fungicide
Ryania*		1200	55	insecticide
Malathion		1375	24	insecticide
Pyrethrum*		1500	18	insecticide
Propargite	Omite	2200	43	acaricide
Sabadilla*		4000	36	insecticide
Glyphosate	Round-up	4300	15	herbicide
Cryolite*	Kryocide	10,000	21	insecticide
Benomyl	Benlate	>10,000	53	fungicide
*Bacillus thuringiensis**	Dipel	15,000	8	insecticide

NOTE: Some materials on this list may not be currently registered as pesticides or their use may be restricted.

*asterisk indicates chemical was acceptable for organically grown produce.

[a]LD_{50} indicates the amount of pesticide that will kill half of a group of test animals. These values are for milligrams of pesticide per kilogram of body weight. These figures do not provide an indication of the chronic health risk or persistence in the environment.

[b]EIC or Environmental Impact Quotient is a method to calculate the environmental impact of most common fruit and vegetable pesticides (insecticides, acaricides, fungicides and herbicides) used in commercial agriculture. The values obtained from these calculations can be used to compare different pesticides and pest management programs to ultimately determine which program or pesticide is likely to have the lower environmental impact.

[1]Estimated EIQ.

“All substances are poisons; there is none which is not a poison. The right DOSE differentiates a poison from a remedy.”

–Paracelsus (1493-1541)

Even too much water can kill – over 1.5 liters/hour

Woman dies after water-drinking contest

Water intoxication eyed in ‘Hold Your Wee for a Wii’ contest death

Associated Press

Updated: 10:24 p.m. ET Jan 13, 2007

SACRAMENTO, Calif. - A woman who competed in a radio station’s contest to see how much water she could drink without going to the bathroom died of water intoxication, the coroner’s office said Saturday.

Jennifer Strange, 28, was found dead Friday in her suburban Rancho Cordova home hours after taking part in the “Hold Your Wee for a Wii” contest in which KDND 107.9 promised a Nintendo Wii video game system for the winner.

“She said to one of our supervisors that she was on her way home and her head was hurting her real bad,” said Laura Rios, one of Strange’s co-workers at Radiological Associates of Sacramento. “She was crying and that was the last that anyone had heard from her.”

NBC VIDEO

Launch

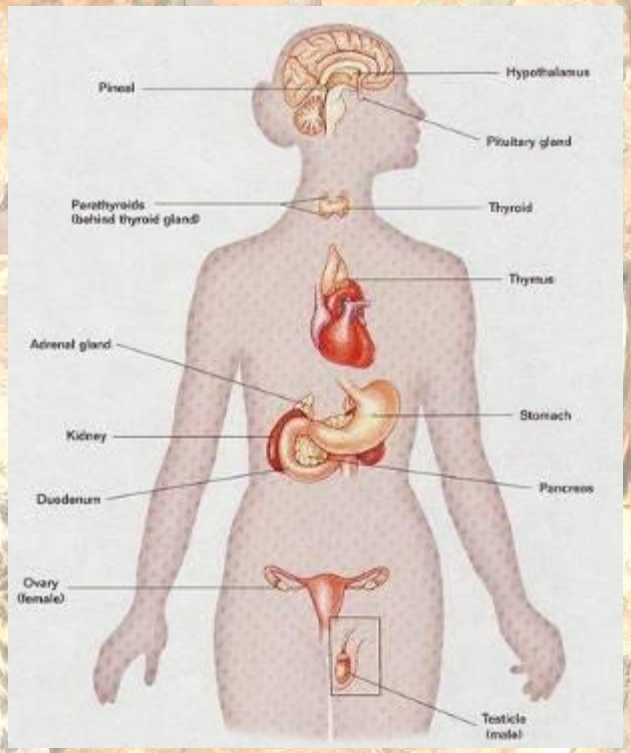
Woman in water drinking contest dies

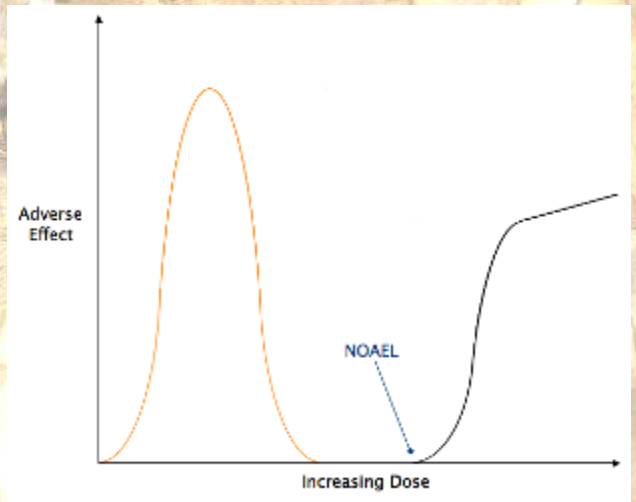
Jan. 15: Sacramento Bee reporter Christina Jewett talks to MSNBC-TV’s Contessa Brewer about the death of a woman who had competed in a radio station contest.

MSNBC

Endocrine effects

- EPA is just beginning to do endocrine disrupter screening for pesticide active and inert ingredients
- http://www.epa.gov/scipoly/oscpendo/index.htm
- http://www.epa.gov/scipoly/oscpendo/pubs/final_list_frn_041509.pdf
- Does the dose make the poison?? What about hormesis?
- http://www.belleonline.com/index.htm





So what is an organic gardener to do about pests?

- Think first… Spray last!
- Practice Integrated Pest Management (IPM)
- Identify the pest specifically
  - www.gotpests.org
- Only use pesticides (organic or not) as a last resort
- Choose the least toxic and most specific pesticide available
- Use all pesticides with great caution and respect

Spare all sprays, **even organic**, to protect beneficial insects

- **Dragonflies**
- **Spiders**
- **Small parasitic wasps**
- **Predatory mites**
- **Syrphid flies**
- **Ground beetles**

The key to proper use

- Read and follow the label & MSDS
- Do your homework
- If you are a commercial grower
  - –only use products approved for agricultural use

www.thinkfirstspraylast.org

www.gotpests.org

GOT PESTS?
- About Got Pests?
- Is It Really a Pest?
- Pest Solutions
- A Word About Pesticides
- Want to Know More?

ASK the EXPERT

Home

Got Pests?

Pests can be insects, weeds, fungi, mice and other animals, or microorganisms, like bacteria and viruses. Before you swat, stamp, or spray, know your enemy and, **most importantly, know that it is an enemy, and not a beneficial or harmless plant or animal.**

We need your help to improve the *GotPests?* website! Please click here to take our quick Survey now.

Do you know the name of your pest?

Type the name of your pest here: Go

If not, select from the options below.

Where is it found?

What kind of pest is it?

QUICK FIND
Bed Bugs
Invasive Pests
Late Blight of Potatoes/Tomatoes
Mosquitoes
Ticks
What's New?

LINKS
Maine Board of Pesticides Control
Maine Center for Disease Control & Prevention
Maine Department of Agriculture
Maine Forest Service
Maine Integrated Pest Management Council
Maine YardScaping Partnership
PRO New England
University of Maine Cooperative Extension IPM for Maine Homeowners
- Have Your Pest Identified (Diagnostic Lab)

USDA APHIS Wildlife Services

www.yardscaping.org

Resources

- http://www.nlm.nih.gov/medlineplus/
- http://www.pesticideinfo.org/
- http://www.epa.gov/pesticides/biopesticides/regtools/25b_list.htm
- http://www.omri.org
- http://www.ams.usda.gov/AMSv1.0
- http://www.ncbi.nlm.nih.gov/pubmed/16403682
- http://spot.colorado.edu/~carpenh/Magkos.pdf
- http://blogs.scientificamerican.com/science-sushi/2012/09/24/pesticides-food-fears/